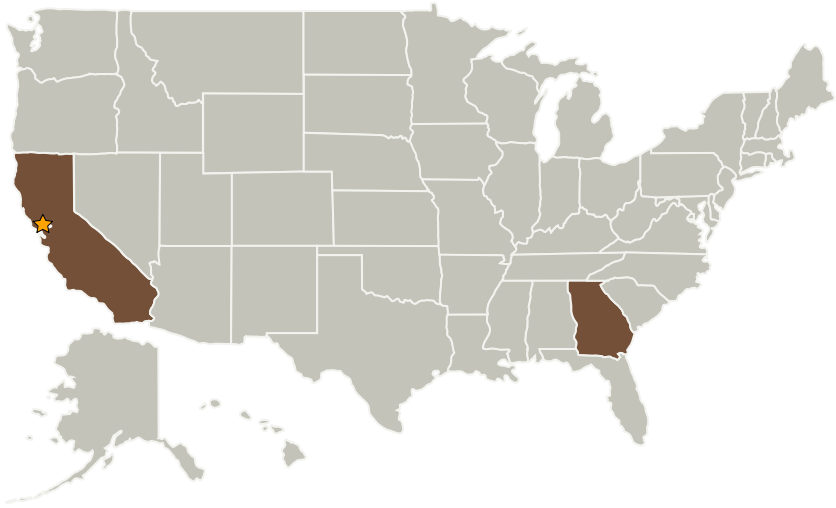
Composable Mission Framework for Rapid End-to-End Mission Design and Simulation, Phase I

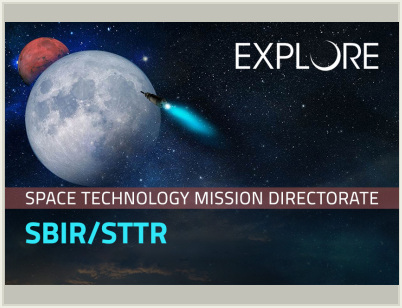
Completed Technology Project (2009 - 2009)

Project Introduction

The innovation proposed here is the Composable Mission Framework (CMF) a model-based software framework that shall enable seamless continuity of mission design and simulation from early stage advanced studies to detailed mission design and development. The uniqueness of our approach lies in using an open standard for systems modeling and design (SysML) to wrap mission models including the mission development process thus providing a coherent map of mission knowledge. InterCAX's Composable Object technology provides the backend wrapping, model management, and simulation orchestration capabilities to the visual SysML-based mission model at the front end. The Composable Object technology has already demonstrated the ability to power SysML-based models with math simulation capabilities for early design stages. ParaMagic is a commercially available tool being used by early adopters of SysML at JPL. The Composable Object technology has also demonstrated the ability to associate detailed design and simulation models such as those created in CAD and FEA tools. However, a big gap exists in the SysML-based world for conceptual system design and the detailed system design-based world. If the detailed system design and simulation models could be wrapped as SysML objects and the simulations and workflows orchestrated by the Composable Object technology, it will cover the entire gamut of complex system modeling and analysis world from trade studies and optimization to project scheduling. The key objective of Phase 1 is to wrap both conceptual and detailed system design and simulation models as SysML objects which has not been done before, and to demonstrate continuity of mission concepts from simple to detailed implementation.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
InterCAX, LLC	Supporting Organization	Industry	Atlanta, Georgia

Primary U.S. Work Locations	
California	Georgia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.3 Mission Operations and Safety
    - TX07.3.1 Mission Planning and Design